

PHYS 6: INTRODUCTORY PHYSICS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2021
Units:	5
Hours:	5 lecture per week (60 total per quarter)
Prerequisite:	MATH 48C or equivalent.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU/UC
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- Students should understand the following basic concepts from Electricity: Charges, electric forces and electric field.
- Students should understand the following basic concepts from mechanics: Kinematics, Newton's Laws, Energy, and Momentum

Description

Lectures, demonstrations, and problems in mechanics, electricity and magnetism.

Course Objectives

The student will be able to:

- Make deductions from the laws of physics
- Analyze problem situations mathematically
- Derive special formulas from general principles
- Identify a problem in a new situation and apply their knowledge to unfamiliar situations
- Assess the limitations of physics laws
- Understand how different cultures have contributed to physics

Course Content

- Fundamental ideas
 - Dimensional analysis (units)
 - Scientific notation
 - Algebra
 - Trigonometry
 - Analytic geometry
 - Limits
 - Elementary calculus
- Kinematics
 - Speed, velocity
 - Acceleration
 - Free fall
 - Vector addition of velocities
 - Trajectories
 - Circular motion
- Forces
 - Mass, weight

- Newton's laws of motion
- Vector addition of forces
- Friction
- Newton's law of gravitation
- Free body diagrams
- Torque
- Solution of statics and dynamic problems
- Energy and momentum
 - Work
 - Potential energy
 - Kinetic energy
 - Power
 - Conservation of power
 - Linear momentum
 - Collisions
 - Conservation of momentum
- Rotational kinematics and dynamics
 - Speed acceleration
 - Rotational inertia
 - Rotational kinetic energy
 - Angular momentum
- Electrostatics
 - Coulomb's law
 - Electric fields
 - Electric potential
 - Capacitance
 - Dielectrics
- Circuit properties
 - Current, resistance, Ohm's law
 - Electrical power
 - Resistivity
 - Series and parallel circuits
 - Meters
- Magnetism
 - Magnetic field
 - Sources of magnetic fields
 - Earth's magnetism
 - Induced emf
 - Inductance
- Contributions made to physics
 - Individuals
 - Cultures

Lab Content

Not applicable.

Special Facilities and/or Equipment

- When taught on campus: none.
- When taught via Foothill Global Access: on-going access to computer with email software and capabilities; email address; JavaScript enabled internet browsing software.

Method(s) of Evaluation

Assignments
Two in-term tests
Final comprehensive examination

Method(s) of Instruction

Lecture
Discussion

Cooperative learning exercises
Demonstration

Representative Text(s) and Other Materials

Walker, James S.. *Physics, 4th ed.*. 2010.

Although this text is older than the suggested "5 years or newer" standard, it remains a seminal text in this area of study.

When taught via Foothill Global Access: supplemental lectures, handouts, tests and assignments delivered via email and/or internet; feedback on tests and assignments delivered via email and/or internet; class discussion may be delivered in chat rooms, listservs and newsgroups.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

- A. Students will be expected to complete weekly problem sets as homework.
- B. Students will be expected to read the material in the text prior to the lectures.

Discipline(s)

Physics/Astronomy